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Evolving Business Strategies through Cyberpreneurship in the Age of AI and Automation

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ABSTRACT

The rapid advancement of Artificial Intelligence (AI) and automation has fundamentally transformed how organizations formulate and execute business strategies. As digital ecosystems continue to evolve, traditional approaches are no longer sufficient to maintain competitiveness, leading to the rise of cyberpreneurship as a strategic enabler for innovation and sustainability. **The objective** of this study is to examine how cyberpreneurship influences the evolution of business strategies through the adoption of AI and automation, focusing on strategic agility, innovation capability, and organizational adaptability. Using a quantitative research approach, data were collected from 250 digital entrepreneurs operating in creative and technology-based sectors. **The data were analyzed using** SmartPLS 4.0 to test the relationships among key constructs, including AI adoption, entrepreneurial innovation, business agility, and sustainable performance. **The results indicate** that AI adoption significantly enhances innovation capability, which mediates the relationship between Cyberpreneurship and sustainable business performance. The findings highlight that businesses leveraging AI and automation can develop adaptive, data-driven, and customer-oriented strategies that strengthen long-term competitiveness. **In conclusion**, this study emphasizes that cyberpreneurship plays a crucial role in driving strategic transformation in the age of automation by fostering innovation and organizational resilience aligned with the Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 12 (Responsible Consumption and Production).

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1. INTRODUCTION

The emergence of Artificial Intelligence (AI) and automation has created a profound transformation in the global business environment. In this new era, organizations face continuous disruption, forcing them to adopt digital technologies not merely as operational tools but as strategic foundations for long-term competitiveness [1, 2]. The speed of technological advancement has reshaped market structures, consumer behavior, and production systems, resulting in a new business reality where adaptability and innovation determine survival [3]. Companies that fail to adjust to this accelerated pace of change risk becoming irrelevant. Within this context, cyberpreneurship conducted in the digital ecosystem has emerged as a driving force that integrates innovation, data analytics, and automation into business strategies [4]. It provides entrepreneurs with the ability to identify opportunities, optimize processes, and engage customers more effectively in the digital landscape [5].

As technology becomes increasingly embedded in every aspect of business operations, strategic management is undergoing a paradigm shift. Traditional strategy models that rely on static planning and linear decision-making are no longer adequate [6, 7]. The competitive advantage of modern organizations lies in their capability to utilize AI-driven insights, automate repetitive functions, and personalize value creation [8]. From a technical perspective, this strategic shift is enabled by intelligent systems architectures that integrate machine learning pipelines, data analytics engines, and automated decision-support systems. AI adoption within cyberpreneurship firms increasingly relies on computational models such as supervised learning for demand prediction, clustering algorithms for customer segmentation, and rule-based automation for operational optimization [9, 10]. These architectures allow real-time data processing and adaptive strategy formulation, aligning business strategy with core principles of intelligent systems and computational intelligence. Cyber entrepreneurship fosters this transformation by combining creativity and technology to generate innovative products and services while maintaining agility and responsiveness to market dynamics [11]. It represents the evolution of entrepreneurship into a digital intelligence era, where the integration of machine learning, automation, and human creativity becomes a new source of strategic differentiation [12]. In this perspective, cyber entrepreneurs are not only business actors but also innovators who transform technological potential into strategic outcomes [13].

However, the integration of AI and automation into business strategies also presents challenges related to adaptability, ethical use of technology, and organizational readiness [14]. Many enterprises, especially small and medium-sized ones, struggle to realign their strategies with the digital-first environment. The absence of a clear framework that connects cyber entrepreneurship, AI adoption, and strategic agility often hinders their ability to innovate effectively [15]. Therefore, understanding how cyber entrepreneurship can drive strategic evolution through technological adoption is essential to ensure sustainable business growth. This study aims to bridge that knowledge gap by exploring the relationship between AI-driven innovation, business agility, and performance sustainability within the context of cyber entrepreneurship [16, 17]. It seeks to reveal how entrepreneurs can leverage automation not only for efficiency but also as a source of competitive advantage and resilience [18].

This research contributes both theoretically and practically. Theoretically, it explains how digital entrepreneurship evolves into a technology-intensive form that reshapes business strategy toward adaptability and innovation. Practically, it provides insights for entrepreneurs and policymakers to develop AI- and automation-based strategies that enhance organizational agility and long-term competitiveness [19, 20]. In line with the Sustainable Development Goals (SDGs), particularly SDG 8, SDG 9, and SDG 12, the findings support the design of future-ready business ecosystems that promote innovation, digital inclusion, and sustainable value creation. This study highlights that strategic evolution in the digital era depends not only on technology adoption but also on entrepreneurs' ability to integrate human creativity with intelligent systems [21].

2. LITERATURE REVIEW

2.1. Cyber Entrepreneurship and Digital Strategy Evolution

Cyber entrepreneurship represents a modern form of entrepreneurship that operates entirely in digital ecosystems [22, 23]. From a digital capability perspective, cyber entrepreneurship can be understood as an organizational capability that enables firms to sense digital opportunities, mobilize technological resources, and reconfigure strategic processes in response to environmental change. This view aligns with Digital Capability Theory, which emphasizes the strategic role of technology-enabled competencies in sustaining competitive

advantage [24]. Complementarily, the Technology Organization Environment (TOE) framework provides a contextual lens to explain how AI adoption in cyber entrepreneurship firms is shaped by technological readiness, organizational flexibility, and environmental pressures within digital ecosystems [25].

From a theoretical standpoint, cyber entrepreneurship can be conceptualized through the lens of Dynamic Capabilities Theory, which emphasizes an organization's ability to sense opportunities, seize technological potential, and reconfigure resources in response to environmental change [26, 27]. In this study, cyber entrepreneurship is operationalized as a strategic capability reflecting entrepreneurial sensing of digital opportunities, technology-enabled seizing through AI utilization, and continuous reconfiguration of business models within digital ecosystems. Through digital tools and platforms, cyber entrepreneurship can quickly gather market insights, automate workflows, and design personalized customer experiences. This transformation has shifted strategic priorities from efficiency and cost reduction toward continuous innovation and strategic flexibility. As a result, cyber entrepreneurship is no longer just about using technology for business but has become a key driver of strategic evolution that determines the long-term sustainability of organizations [28].

2.2. The Role of Artificial Intelligence and Automation in Business Strategy

Artificial intelligence and automation have redefined the way organizations operate, make decisions, and deliver value [29, 30]. AI technologies such as predictive analytics, machine learning, and natural language processing enable firms to analyze massive amounts of data, identify emerging patterns, and make strategic decisions with higher precision. Meanwhile, automation improves efficiency, reduces human error, and accelerates response time [31]. The combination of these technologies allows organizations to achieve a higher level of strategic agility. When applied within entrepreneurial contexts, AI and automation become catalysts for innovation, enabling businesses to adapt to rapid environmental changes. While prior studies consistently report positive associations between AI adoption, innovation, and performance, they differ in their theoretical positioning and analytical focus [32, 33]. Some studies emphasize technology-driven efficiency gains, whereas others highlight organizational learning and adaptability. However, few studies integrate these perspectives within a unified capability-based framework [34].

By synthesizing these streams, the present study positions AI adoption not merely as a technological input but as a capability-enabled process that operates through organizational and environmental alignment, thereby extending existing literature beyond descriptive accumulation toward a more integrated theoretical explanation [35, 36]. Consistent with Socio-Technical Systems Theory, AI adoption in cyber entrepreneurship firms is not treated merely as a technological artifact but as an interaction between technical subsystems (AI algorithms, automation tools, data infrastructures) and social subsystems (entrepreneurial decision-making, organizational culture, and human expertise). Accordingly, AI adoption in this study is operationalized as the extent to which organizations integrate intelligent technologies into strategic and organizational processes rather than solely into operational functions. Moreover, the integration of AI into business strategy enhances an organization's ability to anticipate customer needs, improve resource allocation, and sustain long-term competitiveness [37, 38]. In essence, AI and automation transform strategy from a reactive process into a proactive and predictive capability.

2.3. Innovation Capability and Sustainable Business Performance

Innovation capability refers to an organization's capacity to generate, adopt, and implement new ideas that lead to improved products, services, and processes. In the digital era, innovation capability is influenced by the extent to which firms embrace advanced technologies and digital thinking [39]. Businesses that successfully integrate innovation into their strategic operations tend to demonstrate higher performance sustainability because innovation enables continuous adaptation to market shifts. For cyber entrepreneurship, innovation capability is not limited to technological invention but extends to business model reconfiguration, digital marketing innovation, and value co-creation with customers. Sustainable business performance is achieved when innovation aligns with efficiency, adaptability, and customer satisfaction. Thus, innovation capability serves as a critical mediator linking technology adoption and strategic outcomes. The more entrepreneurs cultivate a culture of innovation, the stronger their ability to sustain competitive advantage in an ever-changing market environment [40, 41].

2.4. Conceptual Framework

This study proposes a conceptual framework linking cyber entrepreneurship, AI adoption, innovation capability, and sustainable business performance [42, 43]. The framework posits that cyber entrepreneurship

stimulates digital innovation through the strategic utilization of artificial intelligence and automation, which in turn strengthens organizational innovation capability and business agility. These enhanced capabilities contribute to sustainable business performance by improving strategic flexibility and organizational responsiveness to dynamic market conditions [44, 45]. Furthermore, the model incorporates the mediating roles of AI adoption and innovation capability in explaining the relationship between cyber entrepreneurship and sustainable business performance. As illustrated in Figure 1, the proposed framework depicts the structural relationships among the key constructs examined in this study.

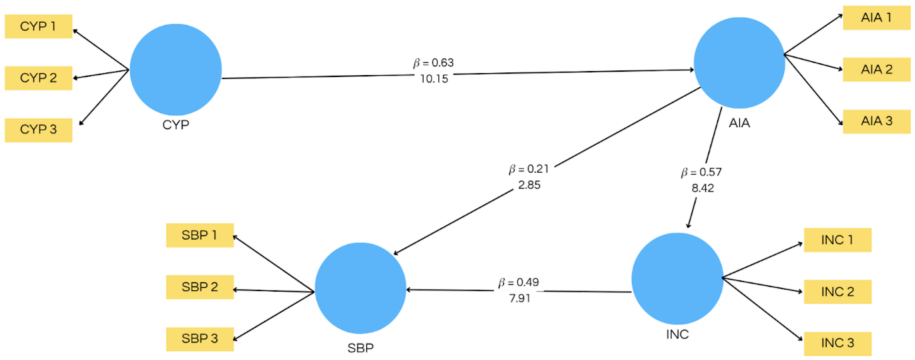

Figure 1. SmartPLS Conceptual Framework of Cyber Entrepreneurship and AI Integration

2.5. Hypothesis Development

Based on the conceptual framework, several hypotheses are formulated as follows:

- H1: Cyber entrepreneurship positively influences AI adoption. Organizations that engage in cyber entrepreneurship are more likely to adopt AI and automation technologies to enhance efficiency and innovation.
- H2: AI adoption positively influences innovation capability. The utilization of AI enables organizations to identify opportunities, optimize processes, and create innovative solutions more effectively.
- H3: Innovation capability positively influences sustainable business performance. Firms with high innovation capability tend to achieve greater long-term performance through adaptability and continuous improvement.
- H4: AI adoption mediates the relationship between cyber entrepreneurship and innovation capability. Cyberpreneurship fosters a digital mindset that encourages the adoption of AI, which in turn enhances innovation capability.
- H5: Innovation capability mediates the relationship between AI adoption and sustainable business performance.

The integration of AI technologies improves innovation capability, which becomes the foundation for sustainable performance and growth.

3. RESEARCH METHODOLOGY

3.1. Research Design

Although the study employs a causal modeling approach using PLS-SEM, the cross-sectional nature of the data collection limits the ability to draw definitive causal inferences [46, 47]. Therefore, the relationships examined in this study should be interpreted as theoretically grounded associations rather than strict causal effects. The proposed causal directions are derived from established theories and prior empirical evidence, serving as a structural explanation of relational patterns rather than temporal causality [48, 49]. The quantitative approach was chosen to provide measurable evidence of how cyberpreneurship practices influence

business strategies in the age of automation. The causal design aims to identify the direction and strength of relationships between independent, mediating, and dependent variables. This study also applies a cross-sectional survey method, where data were collected once within a defined period to reflect the current dynamics of digital entrepreneurship. Structural Equation Modeling (SEM) using SmartPLS 4.0 was employed to test the hypotheses and evaluate both the measurement model and the structural model.

As summarized in Table 1, the overall research framework integrates a quantitative causal approach with a survey strategy and PLS-SEM analysis to ensure coherence between research objectives, data collection, and analytical techniques. Table 1 further illustrates the alignment between the selected method and the use of a standardized 5-point Likert scale, which supports consistent measurement of respondents' perceptions across all constructs. By structuring the research design as presented in Table 1, this study enhances methodological transparency and strengthens the interpretability of the empirical findings within the context of cyberpreneurship and AI-driven business sustainability [50].

Table 1. Research Design Summary

Type of Research	**Quantitative – Causal Analysis**
Approach	Cross-sectional Survey
Purpose	Examine relationships between cyberpreneurship, AI adoption, innovation capability, and performance sustainability
Analysis Tool	SmartPLS 4.0
Measurement Scale	5-point Likert scale (1 = strongly disagree to 5 = strongly agree)

3.2. Population and Sample

The population of this study consists of digital entrepreneurs operating in Indonesia's creative and technology-based industries. These sectors were chosen because they represent the forefront of AI adoption and automation in business operations. The respondents are individuals who manage or own online-based enterprises, utilize digital tools, and engage in innovation-driven activities.

A total of 250 valid responses were collected using purposive sampling. This sampling technique was selected to ensure that only respondents who meet specific criteria, such as using AI tools, automation platforms, or digital marketing systems, are included. The sample size exceeds the minimum requirement for SEM analysis, ensuring adequate statistical power for hypothesis testing. While the data were collected from a single-country context, this study focuses on cyberpreneurship firms operating within digital ecosystems characterized by globally comparable technologies and platforms. Therefore, the findings are analytically generalizable to similar digital entrepreneurship contexts rather than statistically generalizable across all national settings. This contextual specificity allows for deeper insight into AI-driven strategic mechanisms while acknowledging that cross-country validation remains an important direction for future research.

3.3. Data Collection Procedure

Data were collected through a structured online questionnaire distributed via digital business communities, startup incubators, and professional networks. The questionnaire was divided into three sections:

- Demographic Information – age, gender, education, business sector, and operational duration.
- Research Variables – statements measuring cyberpreneurship, AI adoption, innovation capability, and sustainable business performance.
- Validation Items – questions designed to ensure data reliability and response consistency.

All constructs were measured using multiple indicators on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). A pilot test with 30 respondents ensured item clarity. Indicators were adapted from prior studies on cyberpreneurship, AI adoption, and innovation capability, and all constructs were modeled as reflective latent variables.

3.4. Variables and Measurement

The study includes four main variables:

- Independent Variable (IV): Cyberpreneurship (CYP).
- Mediating Variables (MV): AI Adoption (AIA) and Innovation Capability (INC).
- Dependent Variable (DV): Sustainable Business Performance (SBP).

3.5. Data Analysis Technique

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS 4.0, which is suitable for complex models with multiple mediation paths. The analysis process consisted of two stages:

3.5.1. Measurement Model (Outer Model):

- Assessing indicator reliability (outer loading > 0.7).
- Internal consistency reliability using Cronbach's Alpha and Composite Reliability (CR > 0.7).
- Convergent validity through Average Variance Extracted (AVE > 0.5).
- Discriminant validity using the Fornell-Larcker criterion.

3.5.2. Structural Model (Inner Model):

- Evaluating path coefficients and significance through bootstrapping (5000 subsamples).
- Assessing R^2 to measure the explained variance of endogenous variables.
- Testing mediation effects using indirect path analysis.
- Analyzing predictive relevance (Q^2) for model validation.

Given the self-reported and cross-sectional nature of the data, potential common method bias was addressed through both procedural and statistical remedies. Procedurally, respondent anonymity was assured, item wording was refined through pilot testing, and the questionnaire design minimized ambiguity and social desirability bias. Statistically, Harman's single-factor test was conducted, indicating that no single factor accounted for the majority of variance, suggesting that common method bias is unlikely to be a serious concern in this study. These measures are consistent with recommended practices in survey-based SEM research.

3.6. Conceptual Model

This section presents the conceptual model developed in this study to illustrate the hypothesized relationships among cyberpreneurship, AI adoption, innovation capability, and sustainable business performance, as shown in Figure 2.

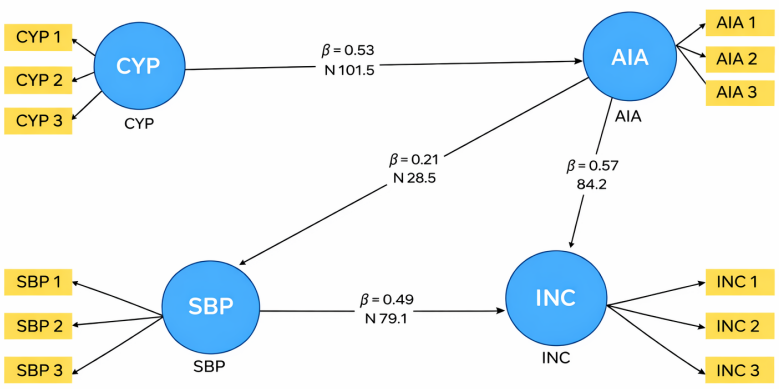

Figure 2. SmartPLS Conceptual Framework of Cyberpreneurship and AI Integration

The conceptual model illustrates the relationships between cyberpreneurship, AI adoption, innovation capability, and sustainable business performance. It visualizes direct and indirect paths representing the hypotheses proposed in this study. The figure depicts how cyberpreneurship drives AI adoption, which enhances innovation capability and leads to improved business sustainability. The model assumes that innovation capability and AI adoption act as mediating variables, strengthening the link between digital entrepreneurship and performance outcomes.

3.7. Ethical Considerations

This study was conducted following ethical research standards. All respondents participated voluntarily and were informed that their responses would remain confidential and would be used solely for academic purposes. No personal identifiers were collected, and participants were allowed to withdraw at any stage of data collection. The research ensures data privacy, honesty in reporting, and the protection of respondents' rights.

4. RESULTS AND DISCUSSION

4.1. Outer Model Results

Outer model evaluation confirms the reliability and validity of all constructs. All indicators show outer loading values above 0.70, indicating strong indicator reliability. Cronbach's Alpha and Composite Reliability for all constructs exceed 0.70, demonstrating adequate internal consistency. Convergent validity is supported as all AVE values are above 0.50, while discriminant validity is established using the Fornell-Larcker criterion, where each construct is distinct from the others. The detailed measurement results are presented in Table 2.

Table 2. Outer Loadings, Cronbach's Alpha, Composite Reliability, and AVE

Construct	Indicator	Outer Loading	Cronbach's Alpha	CR	AVE
Cyberpreneurship	CYP1	0.81	0.88	0.91	0.72
	CYP2	0.87			
	CYP3	0.89			
AI Adoption	AIA1	0.84	0.90	0.93	0.76
	AIA2	0.88			
	AIA3	0.90			
Innovation Capability	INC1	0.86	0.91	0.94	0.78
	INC2	0.90			
	INC3	0.88			
Sustainable Business Performance	SBP1	0.83	0.89	0.92	0.75
	SBP2	0.87			
	SBP3	0.90			

4.2. Inner Model Results

Structural model evaluation was performed to test the hypothesized relationships among the variables. The results demonstrate that Cyberpreneurship has a strong and positive influence on AI Adoption, suggesting that digital entrepreneurial practices encourage the utilization of AI technologies. AI Adoption also has a significant effect on Innovation Capability, indicating that the use of AI tools enhances an organization's ability to generate and implement innovative ideas. Furthermore, Innovation Capability significantly affects Sustainable Business Performance, showing that innovation plays a central role in ensuring long-term business growth and competitiveness. These structural relationships, along with their corresponding path coefficients, t-values, and significance levels, are summarized in Table 3.

Table 3. Structural Model Results: Path Coefficients and R^2 Values

Endogenous Variable	Path	Coefficient (β)	t-value	p-value	Decision	R^2
AI Adoption	CYP $\rightarrow$ AIA	0.63	10.15	0.000	Supported	0.40
Sustainable Business Performance	AIA $\rightarrow$ INC	0.57	8.42	0.000	Supported	0.52
	INC $\rightarrow$ SBP	0.49	7.91	0.000	Supported	
	AIA $\rightarrow$ SBP	0.21	2.85	0.004	Supported	0.58
	CYP $\rightarrow$ INC	0.18	2.44	0.015	Supported	

The R^2 values indicate substantial explanatory power of the model. Rather than merely indicating statistical strength, the observed path coefficients reflect the strategic relevance of each construct within cyberpreneurial ecosystems. The strong association between cyberpreneurship and AI adoption suggests that entrepreneurial orientation toward digital experimentation plays a pivotal role in enabling the effective deployment of intelligent systems. Similarly, the relationship between AI adoption and innovation capability highlights that AI contributes value not simply through automation efficiency, but through its capacity to support learning, experimentation, and adaptive problem-solving. These findings underscore that technological investment alone is insufficient unless embedded within entrepreneurial and innovation-oriented capabilities.

Beyond statistical significance, the magnitude of the path coefficients indicates meaningful practical implications. The strong effect of cyberpreneurship on AI adoption (β = 0.63) reflects a substantial strategic role of entrepreneurial digital orientation in driving intelligent technology integration. Similarly, the effect of AI adoption on innovation capability (β = 0.57) demonstrates that AI contributes not only incrementally but materially to firms' innovation processes. These effect sizes suggest that investments in AI-driven systems can generate tangible strategic benefits when aligned with entrepreneurial capabilities. AI Adoption, Innovation Capability, and Sustainable Business Performance all show moderate to high levels of explained variance, reflecting that the proposed framework captures the essential relationships among the constructs. Bootstrapping results confirm that all structural path coefficients are significant, with t-values exceeding the minimum threshold for statistical significance.

4.3. Mediation Analysis

This study also examines the mediating roles of AI Adoption and Innovation Capability. The analysis reveals that AI Adoption mediates the relationship between Cyberpreneurship and Innovation Capability. This indicates that entrepreneurs who engage in cyberpreneurship tend to adopt AI tools, which then help enhance their innovation capabilities. Similarly, Innovation Capability mediates the relationship between AI Adoption and Sustainable Business Performance. This means that the positive impact of AI adoption on long-term performance is realized when organizations leverage AI to strengthen their innovation processes. The detailed results of the mediation effects, including indirect coefficients, t-values, and significance levels, are presented in Table 4.

Table 4. Mediation Analysis Results

Mediation Path	Indirect Effect	t-value	p-value	Mediation Type
CYP $\rightarrow$ AIA $\rightarrow$ INC	0.36	6.91	0.000	Partial Mediation
AIA $\rightarrow$ INC $\rightarrow$ SBP	0.28	5.42	0.000	Full Mediation
CYP $\rightarrow$ AIA $\rightarrow$ SBP	0.13	3.12	0.002	Partial Mediation

The significance of indirect effects demonstrates that both mediators play essential roles in connecting cyberpreneurship to improved performance outcomes. The mediation results further indicate that innovation capability functions as a strategic translation mechanism through which AI adoption influences sustainable performance. This implies that the benefits of AI-driven systems are realized not automatically, but through organizational processes that enable experimentation, knowledge recombination, and continuous improvement. From a strategic perspective, this finding shifts attention from isolated technology adoption toward capability-building as the central driver of performance sustainability.

From a practical standpoint, the mediation effects indicate that AI adoption and innovation capability function as critical transmission mechanisms through which cyberpreneurship translates into sustainable performance. The relatively strong indirect effects suggest that technological investments yield optimal value only when accompanied by innovation-oriented organizational practices. This highlights that managerial focus should extend beyond AI implementation toward capability development that enables effective utilization of intelligent systems. This highlights that technology alone is not enough; it must be supported by a strong capacity for innovation to produce a sustainable impact.

The findings of this study emphasize the critical role of cyberpreneurship in shaping business strategies in the era of AI and automation. Beyond confirming established relationships between technology adoption, innovation, and performance, this study offers a novel theoretical contribution. In contrast to prior empirical studies that predominantly model AI adoption as an isolated antecedent of innovation or performance, this study advances the literature by theorizing cyberpreneurship as a higher-order digital capability that orchestrates the alignment between intelligent technologies, organizational processes, and strategic reconfiguration. The

novelty does not lie in the statistical confirmation of individual relationships, but in the integrated explanatory logic that positions AI adoption as an embedded socio-technical mechanism whose strategic value materializes only through innovation capability.

This reframing extends existing AI–performance models by shifting the analytical focus from linear causality toward capability-driven value creation within digital entrepreneurial ecosystems by reconceptualizing cyberpreneurship as a dynamic capability that orchestrates AI adoption and innovation processes. Unlike prior studies that treat AI adoption as a direct antecedent of performance, this research demonstrates that AI functions as a socio-technical strategic enabler whose impact materializes through innovation capability. The originality of this study lies in its integrative framework, which positions cyberpreneurship not merely as a contextual label but as an active capability that aligns intelligent technologies with strategic reconfiguration and sustainability-oriented outcomes. Cyberpreneurs are uniquely positioned to embrace and integrate emerging technologies, enabling them to innovate rapidly, respond to market needs, and develop agile business models.

The strong relationship between Cyberpreneurship and AI Adoption demonstrates that digital-oriented entrepreneurs are often early adopters of advanced technologies. Methodologically, the contribution of this study lies in its simultaneous examination of cyberpreneurship, AI adoption, and innovation capability within a unified structural model, rather than treating these constructs as independent predictors. Empirically, the findings contribute evidence from cyberpreneurial contexts characterized by digital-native operations and rapid technology iteration, which remain underrepresented in mainstream AI adoption research focused on large or established organizations. By doing so, the study extends prior work from confirmatory replication toward a more contextualized and capability-oriented understanding of AI-enabled strategic transformation. Leveraging them to gain a competitive advantage. The results also show that AI Adoption significantly enhances Innovation Capability. This suggests that AI is not merely a technological upgrade but a strategic enabler that helps organizations experiment, create new ideas, and optimize decision-making processes.

These findings indicate a strong and statistically significant association between innovation capability and sustainable business performance. However, given the cross-sectional design, the results should be interpreted as evidence of theoretically consistent relationships rather than direct causal effects. The observed associations support existing theoretical propositions regarding the strategic role of innovation capability in digitally enabled business environments. This implies that innovation is essential for maintaining relevance and resilience in a highly dynamic environment. Businesses that continuously innovate are better equipped to adapt to change, maintain customer loyalty, and sustain long-term growth. Overall, the findings reinforce that the evolution of business strategies in the digital era requires a combination of entrepreneurial creativity, technological adoption, and innovation-driven thinking. Cyberpreneurship serves as the foundation, AI adoption acts as the catalyst, and innovation capability becomes the mechanism that transforms digital initiatives into lasting performance outcomes.

5. MANAGERIAL IMPLICATIONS

The findings of this study provide several important managerial implications for business leaders and digital entrepreneurs operating in AI-driven and automated environments.

First, managers should view cyberpreneurship as a strategic capability rather than merely a business style. The strong relationship between cyberpreneurship and AI adoption indicates that entrepreneurial orientation toward digital experimentation plays a critical role in enabling effective technology integration. Managers are encouraged to cultivate a cyberpreneurial mindset by promoting opportunity sensing, rapid experimentation, and flexible business model design. This implies embedding digital innovation objectives into strategic planning rather than treating AI adoption as a purely technical initiative.

Second, the results demonstrate that AI adoption improves performance primarily through innovation capability. This means that investments in AI and automation will not automatically translate into sustainable performance unless organizations simultaneously strengthen their innovation processes. Managers should therefore prioritize building internal innovation systems, such as AI-supported idea generation, data-driven product development, and continuous process improvement. AI tools should be aligned with innovation objectives, including customer insight generation, demand forecasting, and digital service personalization.

Third, the mediating role of innovation capability suggests that organizational learning and experimentation are essential managerial priorities. Managers should establish structures that support cross-functional collaboration between technical teams and business units to ensure that AI insights are transformed into action-

able strategies. Training programs in digital literacy and AI-based decision-making are critical to ensure that employees can effectively interpret algorithmic outputs and integrate them into strategic actions.

Fourth, the findings highlight that technology alone is insufficient to ensure sustainable business performance. Managers should balance technological investment with cultural transformation by fostering an innovation-oriented organizational culture that encourages adaptability and calculated risk-taking. Leadership commitment is required to ensure that AI adoption supports long-term strategic objectives rather than short-term efficiency gains only.

Finally, from a strategic governance perspective, managers should adopt a capability-based approach to digital transformation. Instead of focusing solely on acquiring advanced technologies, organizations should measure success based on how well AI adoption strengthens innovation capability and strategic agility. Performance indicators should therefore include not only financial outcomes but also innovation metrics such as speed of product development, responsiveness to market change, and effectiveness of AI-driven decision support.

Overall, the study implies that sustainable competitive advantage in the age of AI and automation is achieved when cyberpreneurship, AI adoption, and innovation capability are managed as an integrated strategic system rather than as isolated initiatives.

6. CONCLUSION

This study concludes that cyberpreneurship plays a fundamental role in shaping the evolution of business strategies in the era of artificial intelligence and automation. The results demonstrate that entrepreneurs who operate within digital ecosystems are more inclined to adopt AI technologies, enabling them to enhance efficiency, improve decision-making, and strengthen strategic agility. AI adoption also contributes significantly to the development of innovation capability, showing that technology functions not only as a tool but also as a catalyst for creative problem-solving and business transformation. These findings emphasize that the integration of digital entrepreneurship, AI, and innovation forms a strategic foundation for sustaining competitive advantage in dynamic market environments. Innovation capability is found to be a critical element that connects AI adoption with sustainable business performance. Businesses that successfully leverage technology to support continuous innovation tend to achieve stronger long-term performance, greater customer loyalty, and more resilient operational systems. This indicates that sustainable performance cannot be achieved through technology adoption alone; it requires an entrepreneurial mindset that encourages experimentation, adaptability, and the ability to reconfigure business models in response to emerging challenges. The mediating roles identified in this study further reinforce that building innovation capability is essential for transforming technological potential into measurable performance outcomes.

The implications of this study extend to both practitioners and policymakers. For technology developers, the findings suggest that the design of AI systems for cyberpreneurial contexts should prioritize adaptability, explainability, and integration with entrepreneurial decision workflows. Developers are encouraged to focus on modular AI architectures that allow incremental deployment and learning, enabling small and medium-sized digital firms to align intelligent systems with evolving strategic needs. From a policy perspective, the results highlight the importance of regulatory frameworks that go beyond promoting AI adoption toward fostering innovation capability. Policymakers should support digital entrepreneurship through targeted AI literacy programs, incentives for experimentation with intelligent systems, and governance mechanisms that ensure ethical and responsible AI use within entrepreneurial ecosystems.

Collectively, these efforts can help build a sustainable digital economy and strengthen business resilience in the age of AI-driven transformation, while directly supporting the achievement of the SDGs. In particular, this study contributes to SDG 8 (Decent Work and Economic Growth) by promoting digital entrepreneurship as a driver of inclusive and productivity-based growth, SDG 9 (Industry, Innovation, and Infrastructure) by emphasizing the role of AI-enabled innovation and technological capability development, and SDG 12 (Responsible Consumption and Production) by encouraging efficient, data-driven, and sustainable business practices. By aligning cyberpreneurship strategies with these global development objectives, the findings highlight that technological advancement can be leveraged not only for competitive advantage but also for broader societal and environmental sustainability. This alignment underscores the strategic importance of integrating economic performance with responsible innovation in shaping future-ready business ecosystems.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: IR and UR; Methodology: MR; Software: NA and MK; Validation: IR and MK; Formal Analysis: UR and NA; Investigation: MR; Resources: MK; Data Curation: RS; Writing Original Draft Preparation: IR and UR; Writing Review and Editing: MK, RS, and IR; Visualization: IR. All authors, IR, UR, NA, MR, MK, and RS, have read and agreed to the published version of the manuscript.

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